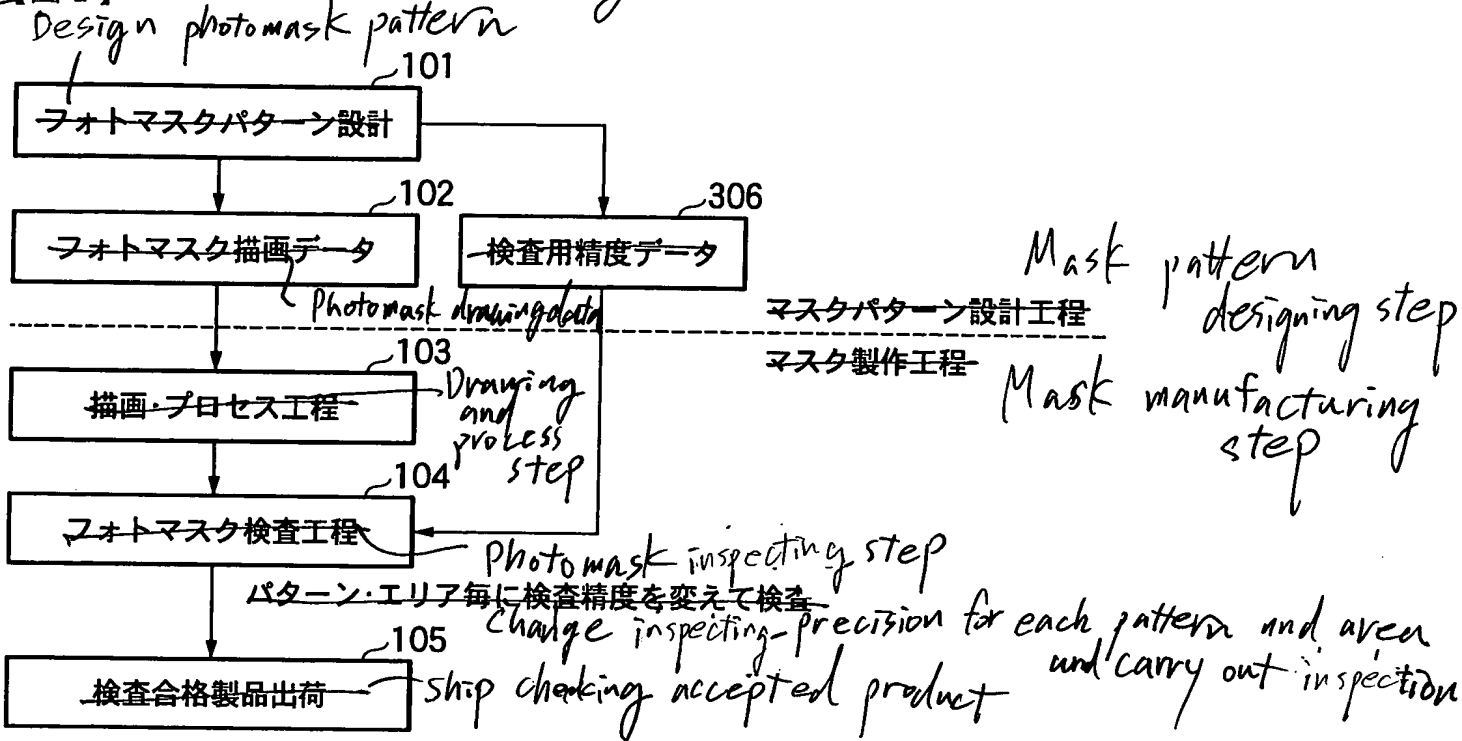
【書類名】　図面

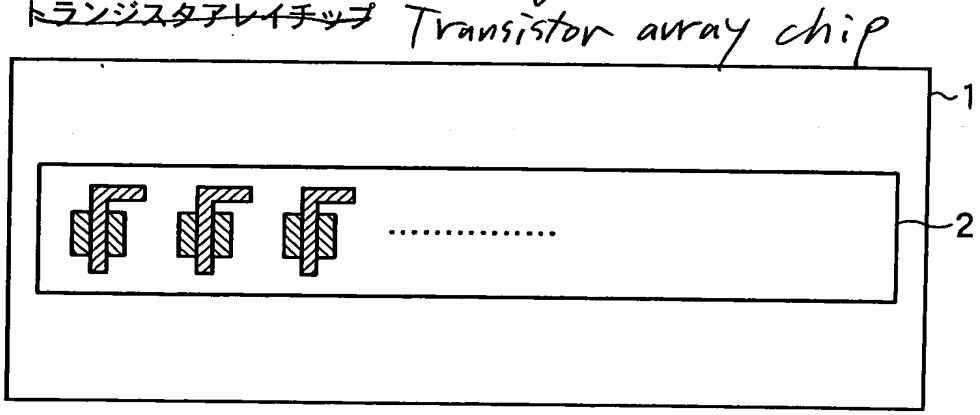
【図１】

Fig. 1



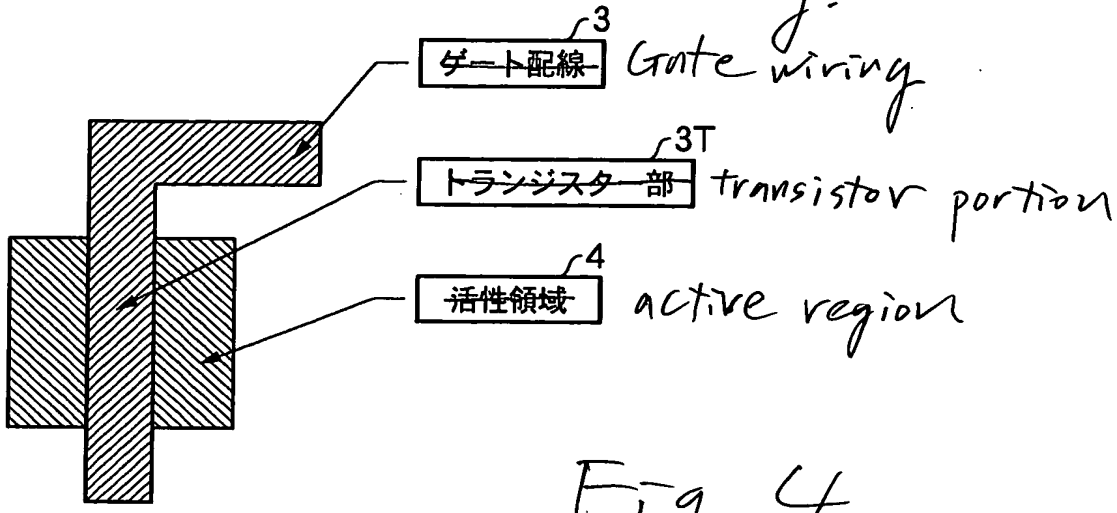
【図２】

Fig. 2



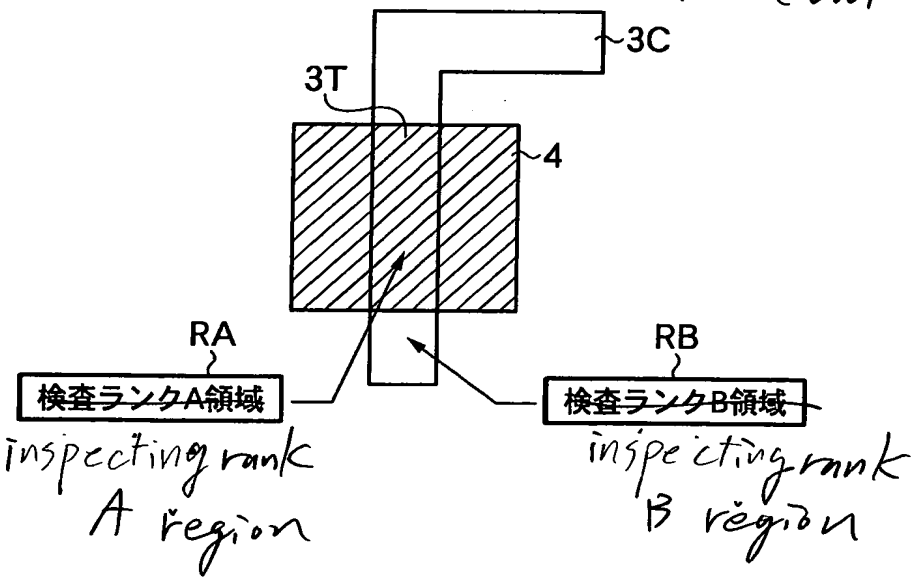
【図３】

Fig. 3



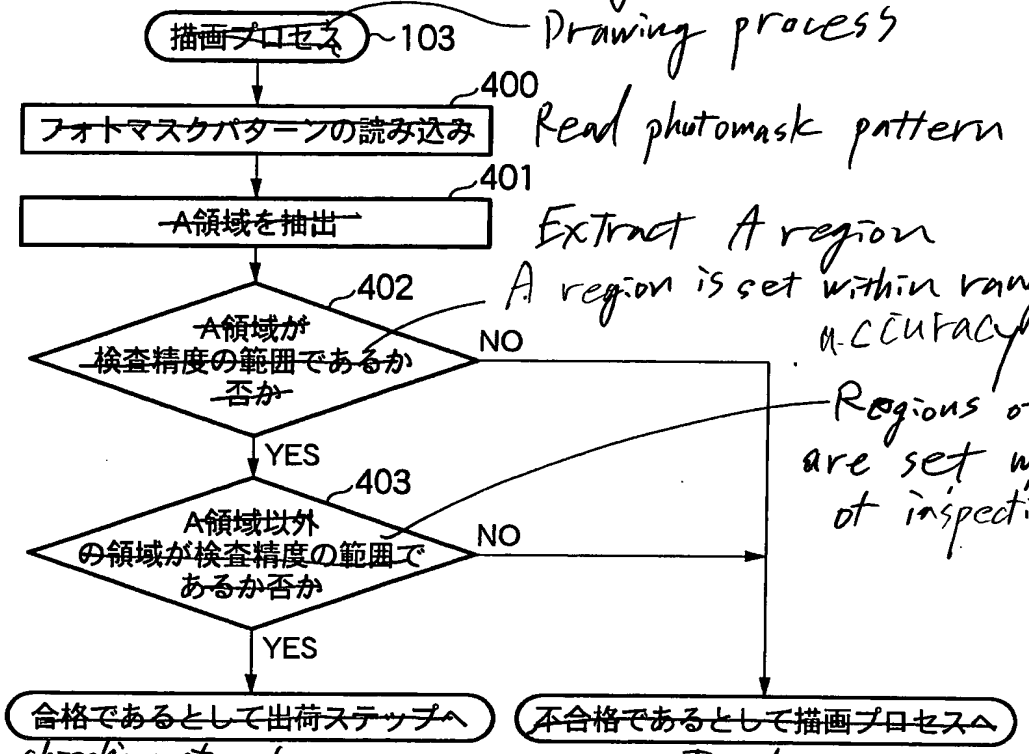
【図４】

Fig. 4



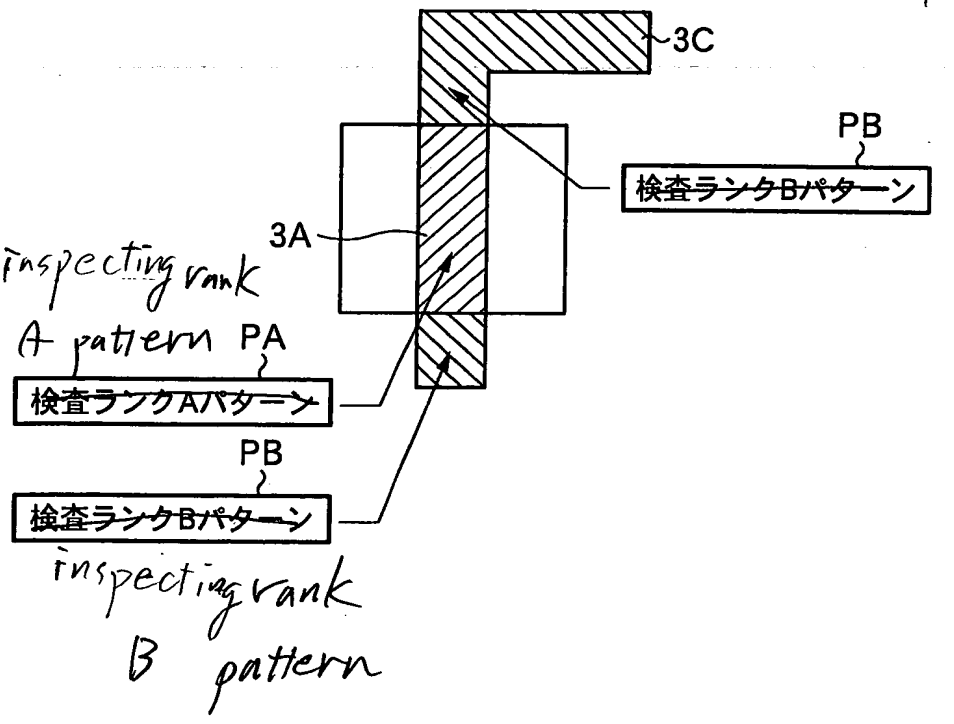
【図5】

Fig. 5



【図6】　Fig. 6

○パターンで指定する場合　In the case in which specification is carried out by edge

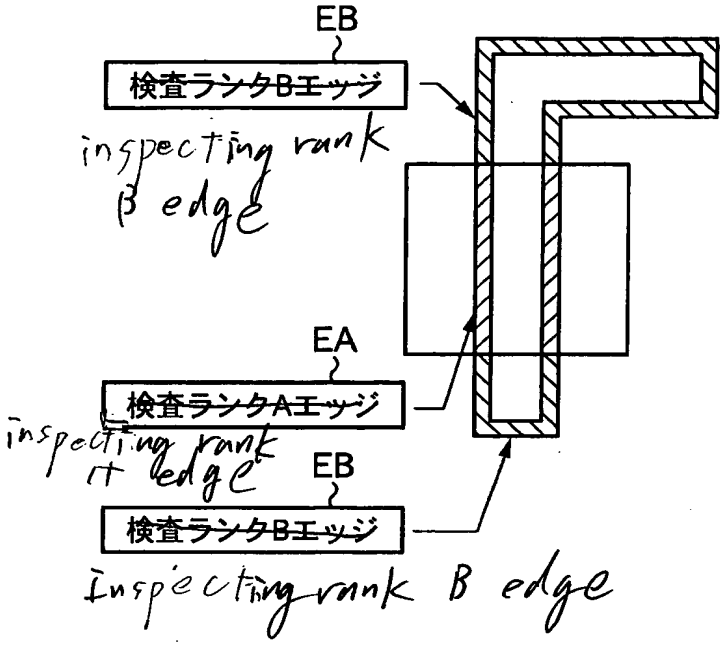


【図７】

Fig. 7

○エッジで指定する場合

In the case in which specification is carried out by edge



【図８】

Fig. 8A

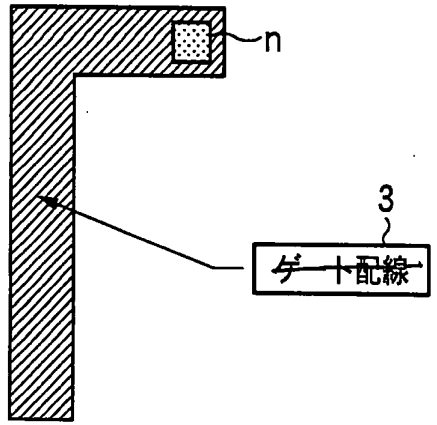
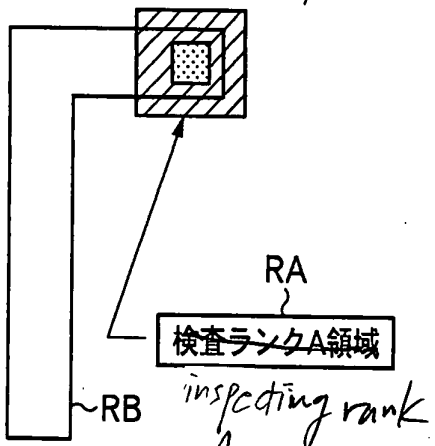
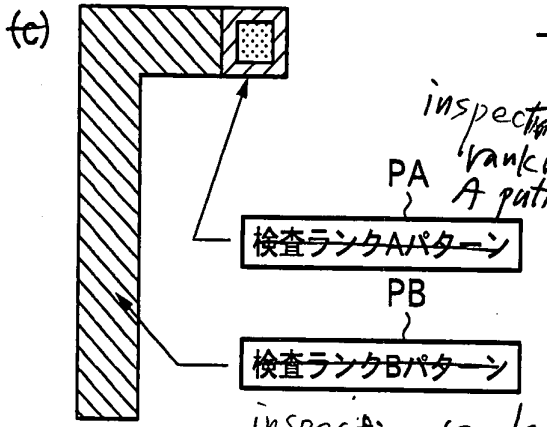


Fig. 8B



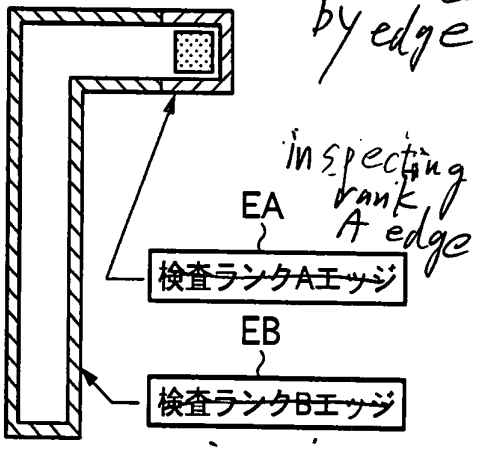
In the case in which specification is carried out by region
○領域で指定する場合

Fig. 8C



In the case in which specification is carried out by pattern
○パターンで指定する場合

Fig. 8D



In the case in which specification is carried out by edge
○エッジで指定する場合

【図9】

Fig. 9A

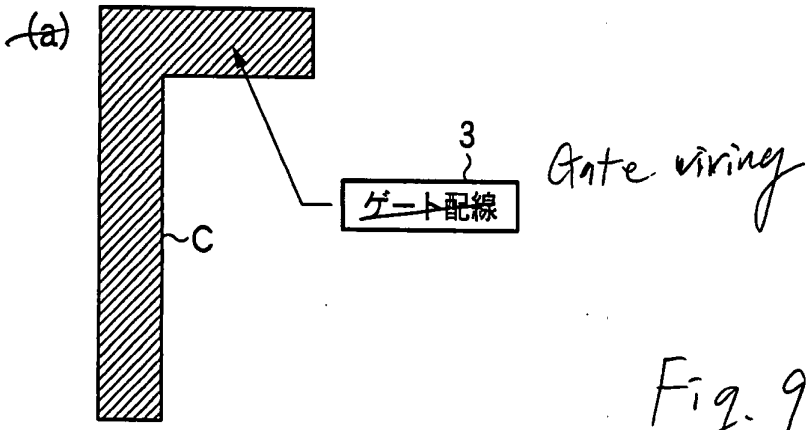


Fig. 9B

In the case in which specification is carried out by region

○領域で指定する場合

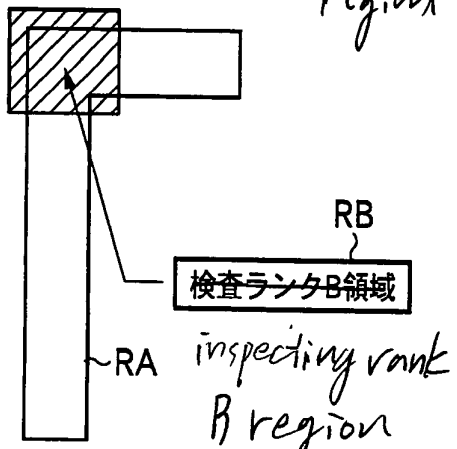


Fig. 9C

In the case in which specification is carried out by pattern

○パターンで指定する場合

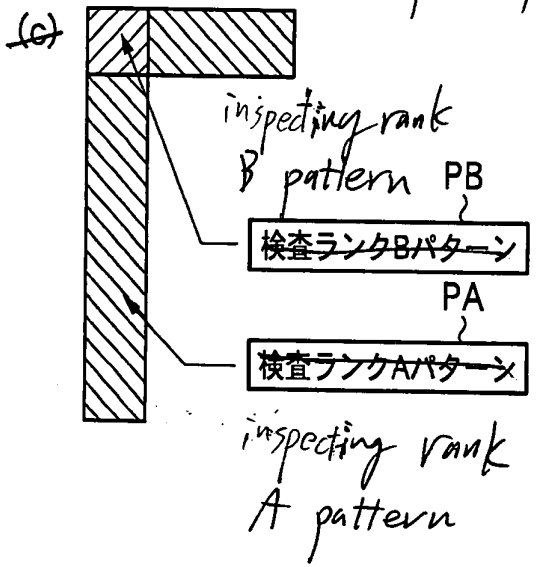
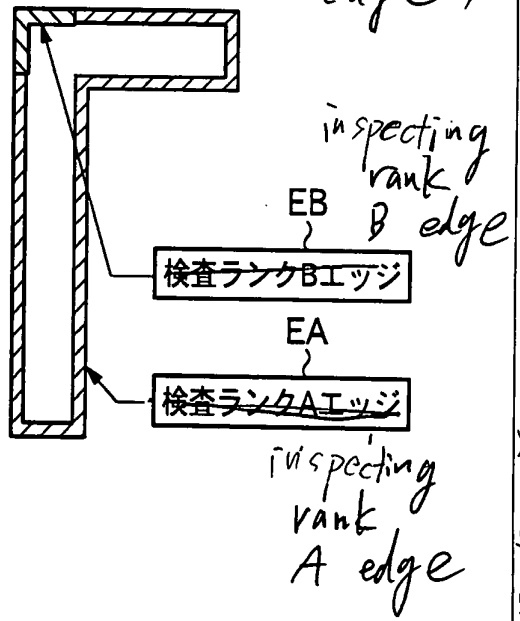


Fig. 9D

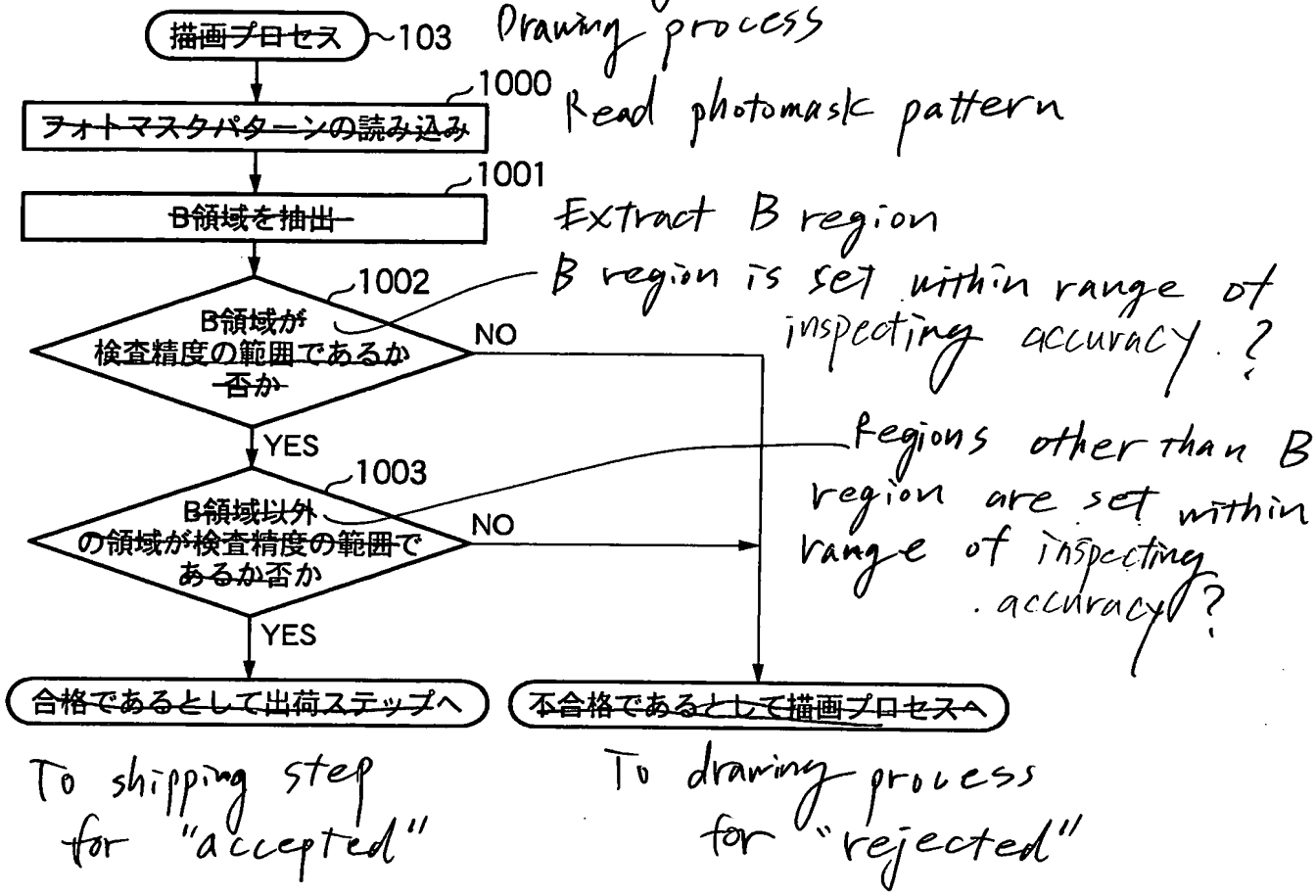
In the case in which specification is carried out by edge

○エッジで指定する場合



【図１０】

Fig. 10


描画プロセス
103
Drawing process
1000
フォトマスクパターンの読み込み
Read photomask pattern
1001
B領域を抽出
Extract B region
1002
B領域が検査精度の範囲であるか否か
B region is set within range of inspecting accuracy?
NO
YES
1003
B領域以外の領域が検査精度の範囲であるか否か
Regions other than B region are set within range of inspecting accuracy?
NO
YES
合格であるとして出荷ステップへ
To shipping step for "accepted"
不合格であるとして描画プロセスへ
To drawing process for "rejected"

【図１１】

Fig. 11A

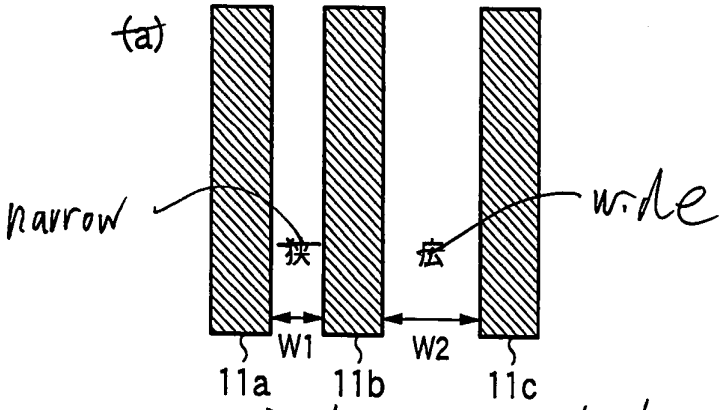
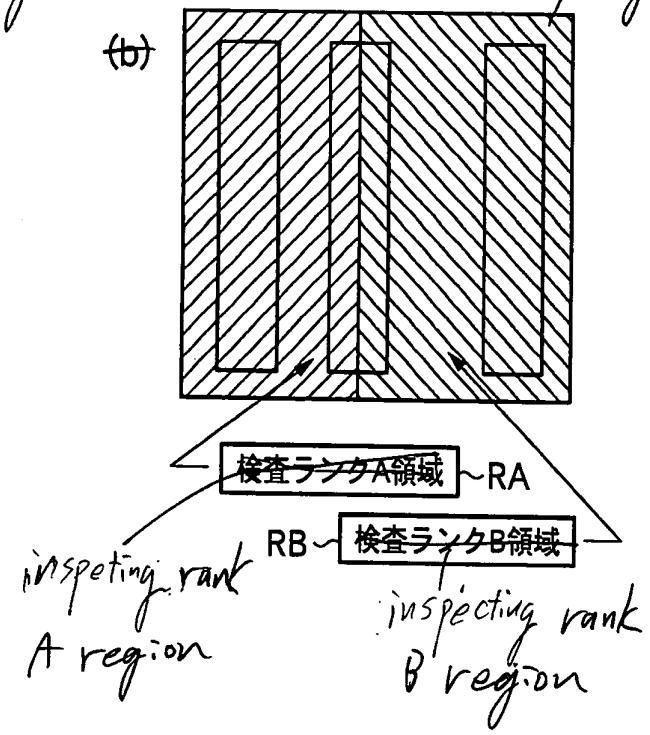
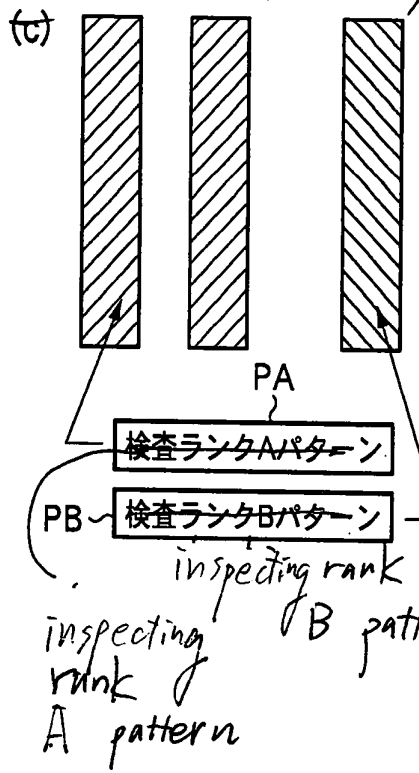


Fig. 11B



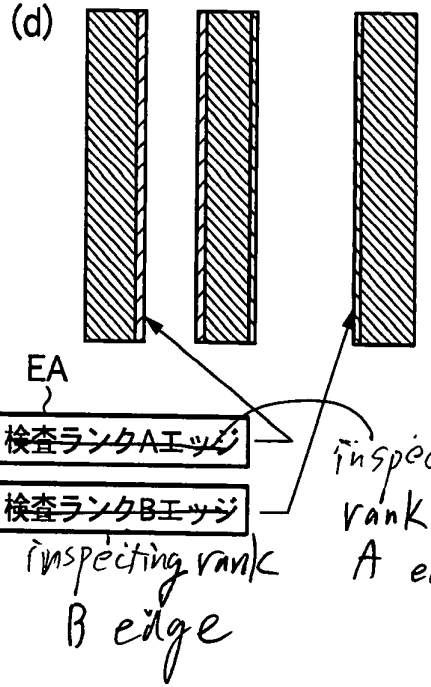
In the case in which specification is carried out ○領域で指定する場合 by region

Fig. 11C



In the case in which specification is carried out ○パターンで指定する場合 by pattern

Fig. 11D



In the case in which specification is carried out ○エッジで指定する場合 by edge

Fig. 12A

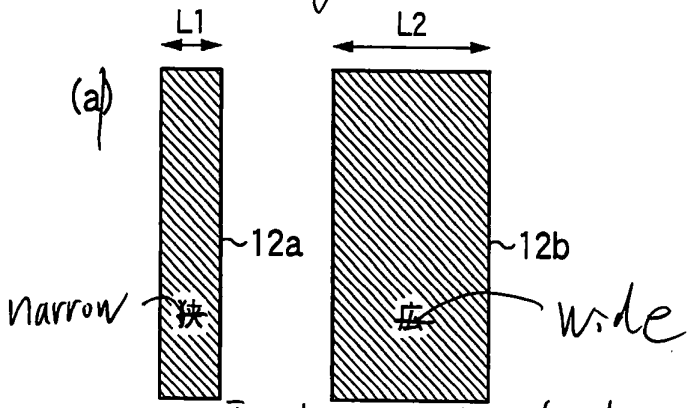


Fig. 12B

In the case in which specification is carried out by region

○領域で指定する場合

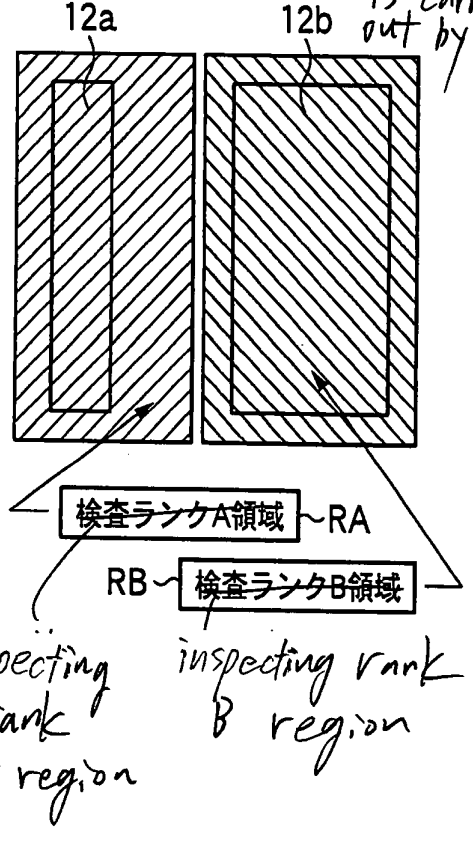


Fig. 12C

In the case in which specification is carried out by pattern

○パターンで指定する場合

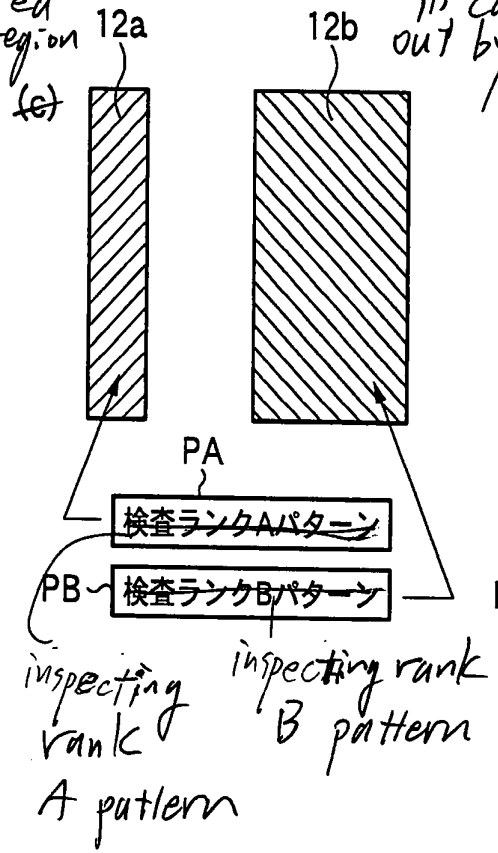
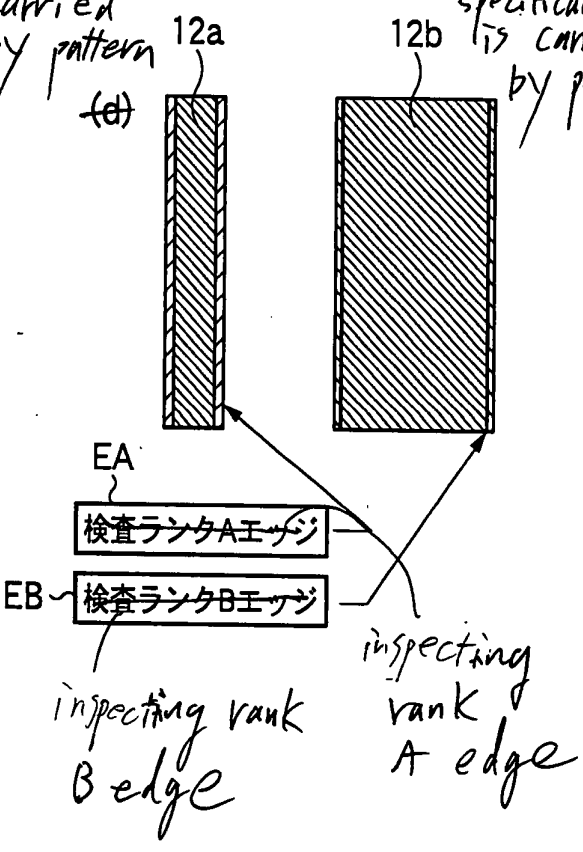


Fig. 12D

In the case in which specification is carried out by pattern

○エッジで指定する場合

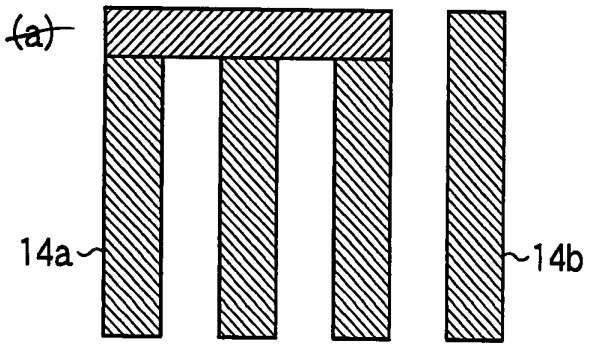


【図１３】

Fig. 13A
(a)
13a
13b
Fig. 13B
(b)
RA
RB
検査ランクA領域
検査ランクB領域
inspecting rank A region
inspecting rank B region
○領域で指定する場合
In the case in which specification is carried out by region
Fig. 13C
(c)
PA
PB
検査ランクAパターン
検査ランクBパターン
inspecting rank A pattern
inspecting rank B pattern
○パターンで指定する場合
In the case in which specification is carried out by pattern
Fig. 13D
(d)
EA
EB
検査ランクAエッジ
検査ランクBエッジ
inspecting rank A edge
inspecting rank B edge
○エッジで指定する場合
In the case in which specification is carried out by edge

【図１４】

Fig. 14A



In the case in which specification is carried out by region

Fig. 14B ○領域で指定する場合

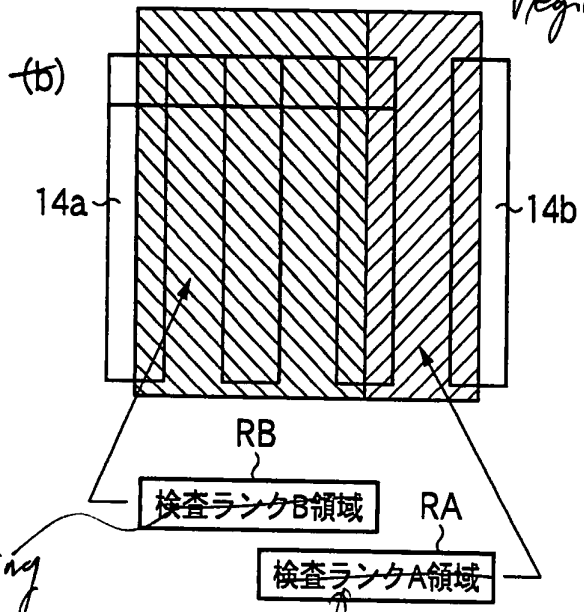


Fig. 14C

In the case in which specification is carried out by pattern

○パターンで指定する場合，

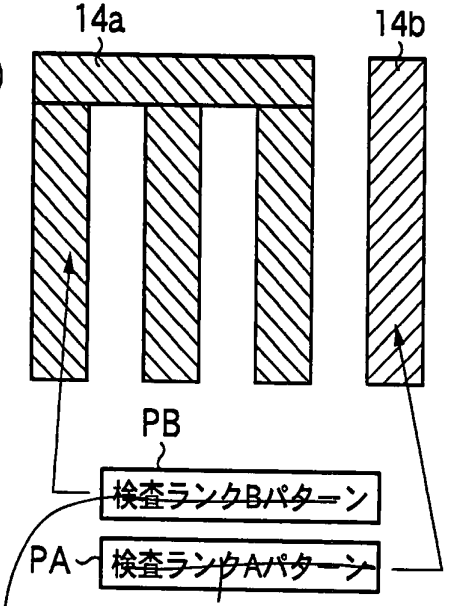
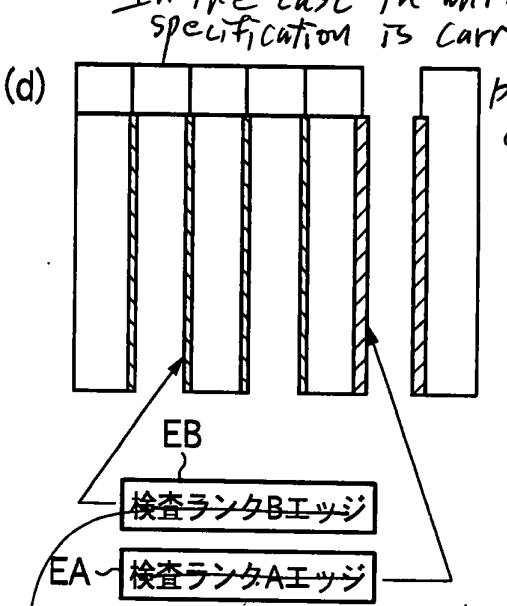


Fig. 14D

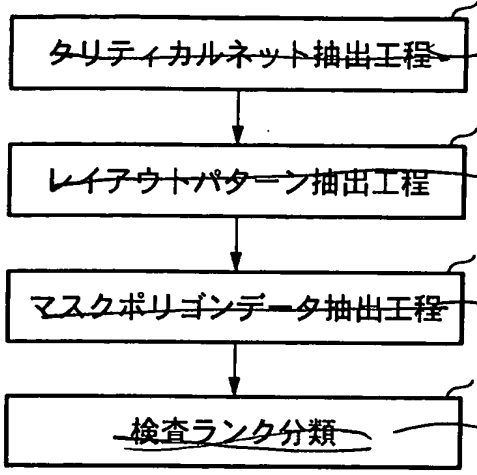
○エッジで指定する場合

In the case in which specification is carried out by edge



【図１５】

Fig. 15



Critical net extracting step

タリティカルの例
・クロックネット
・タイミング制約設定ネット
・アナログネット
（抵抗値・容量の精度が要求される）
・高速信号ネット　etc

Example of critical
• Clock net
• Timing constraint setting net
• Analog net (precision in resistance value and capacity is required)
• High-speed signal net etc

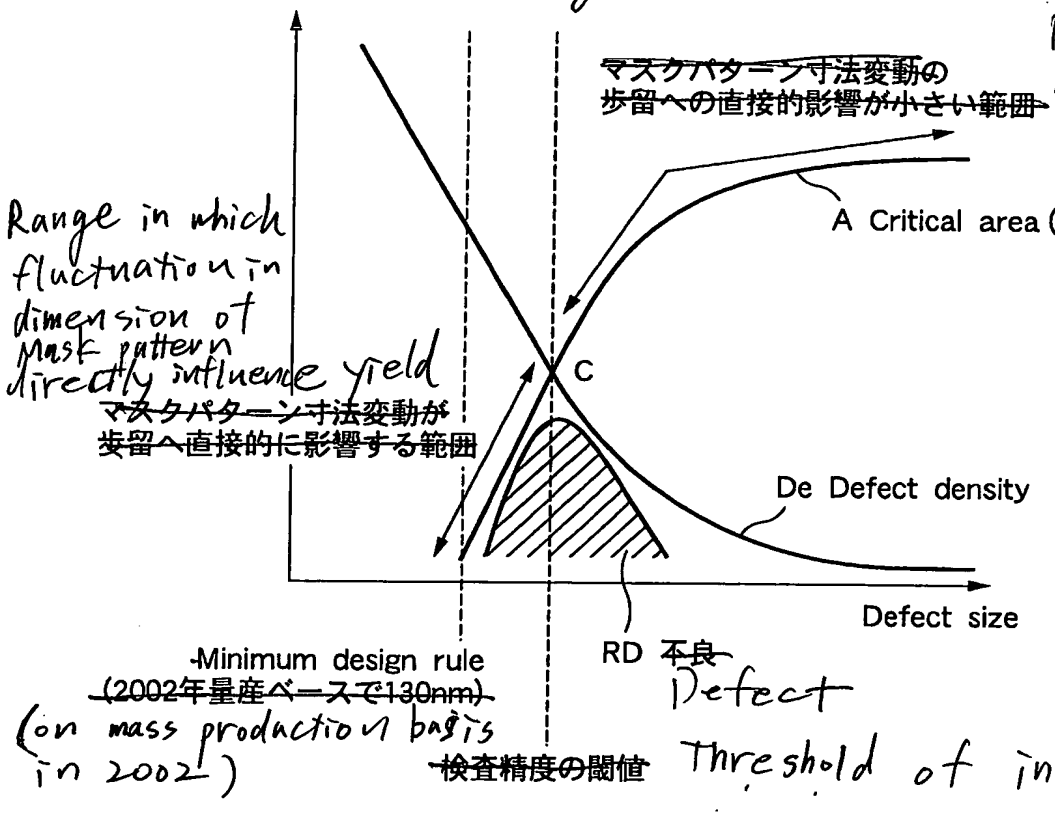
Layout pattern extracting step

Mask polygon data extracting step

inspecting rank classification

【図１６】

Fig. 16



Range in which direct influence of fluctuation in dimension of mask pattern on yield is small

Range in which fluctuation in dimension of mask pattern directly influence yield

(on mass production basis in 2002)

Defect

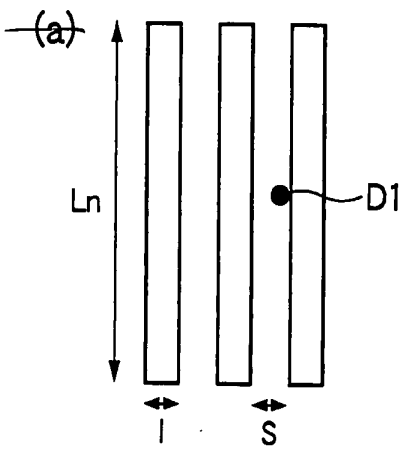
Threshold of inspecting accuracy

【図17】

Fig. 17A

Defect

Short~~不良~~　Area=Ln (l+S)

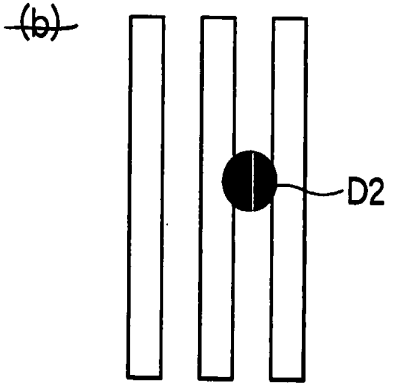


Defect size (x)<S

No short defect ~~Short不良なし~~

Ca (x)=0

Fig. 17B

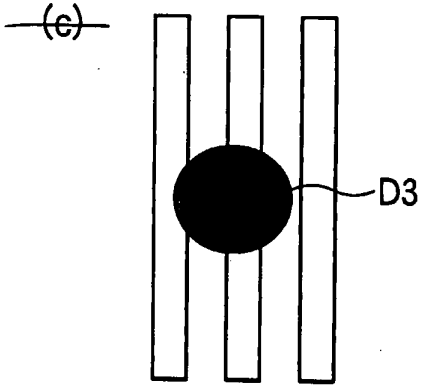


S<Defect size (x)<2l+S

~~場所によってはShort不良~~ Short defect in some places

$$Ca(x)=\frac{Ln(l+S)(X-S)}{(l+S)}$$

Fig. 17C



2l+S<Defect size (x)

~~必ずShort不良~~

Ca (x)=Ln (l+S)

Short defect in all places

【図１８】

Fig. 18A

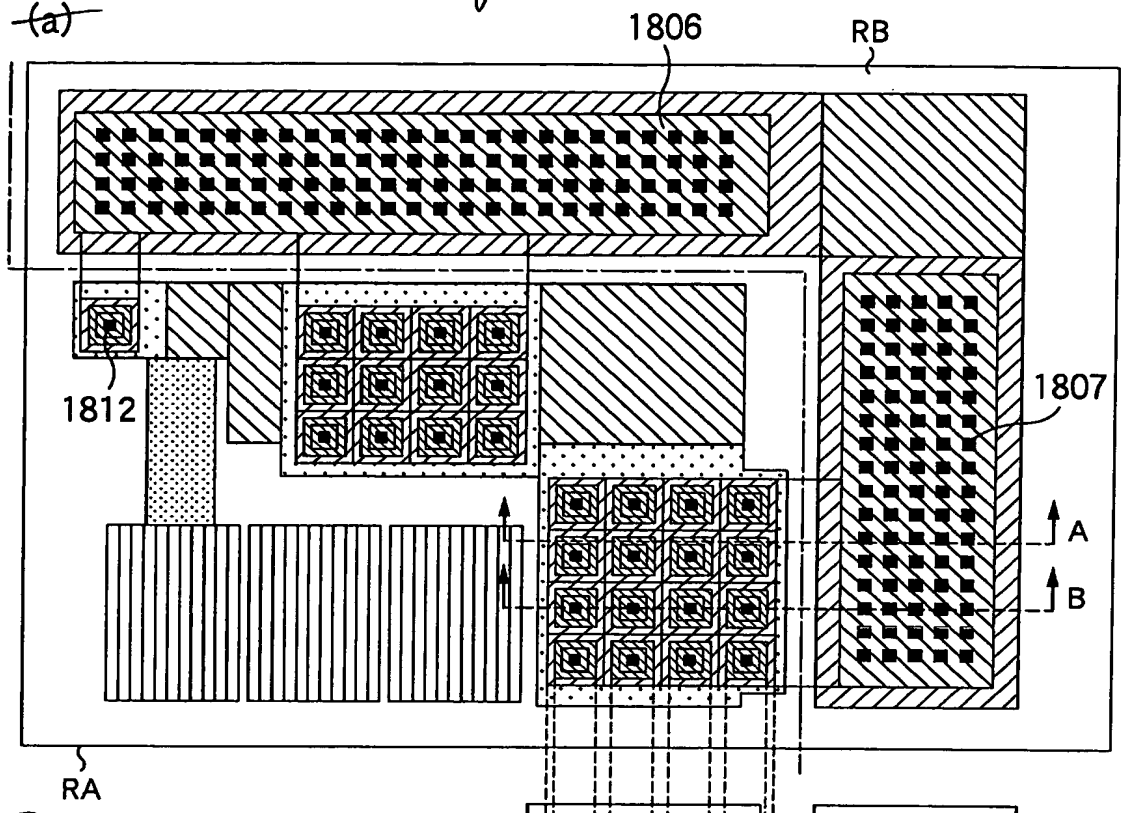


Fig. 18B (b) A断面

A section

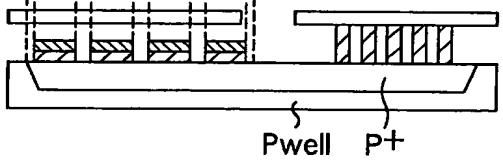
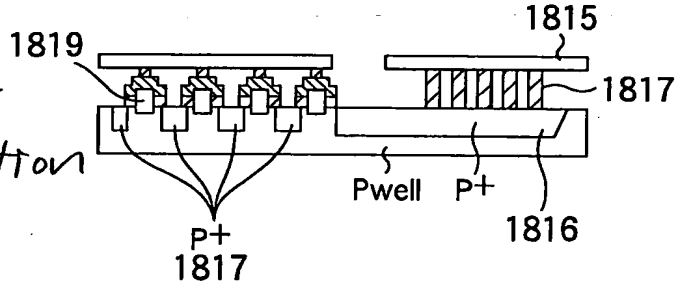


Fig. 18C (c) B断面

B section



~~【図１９】~~

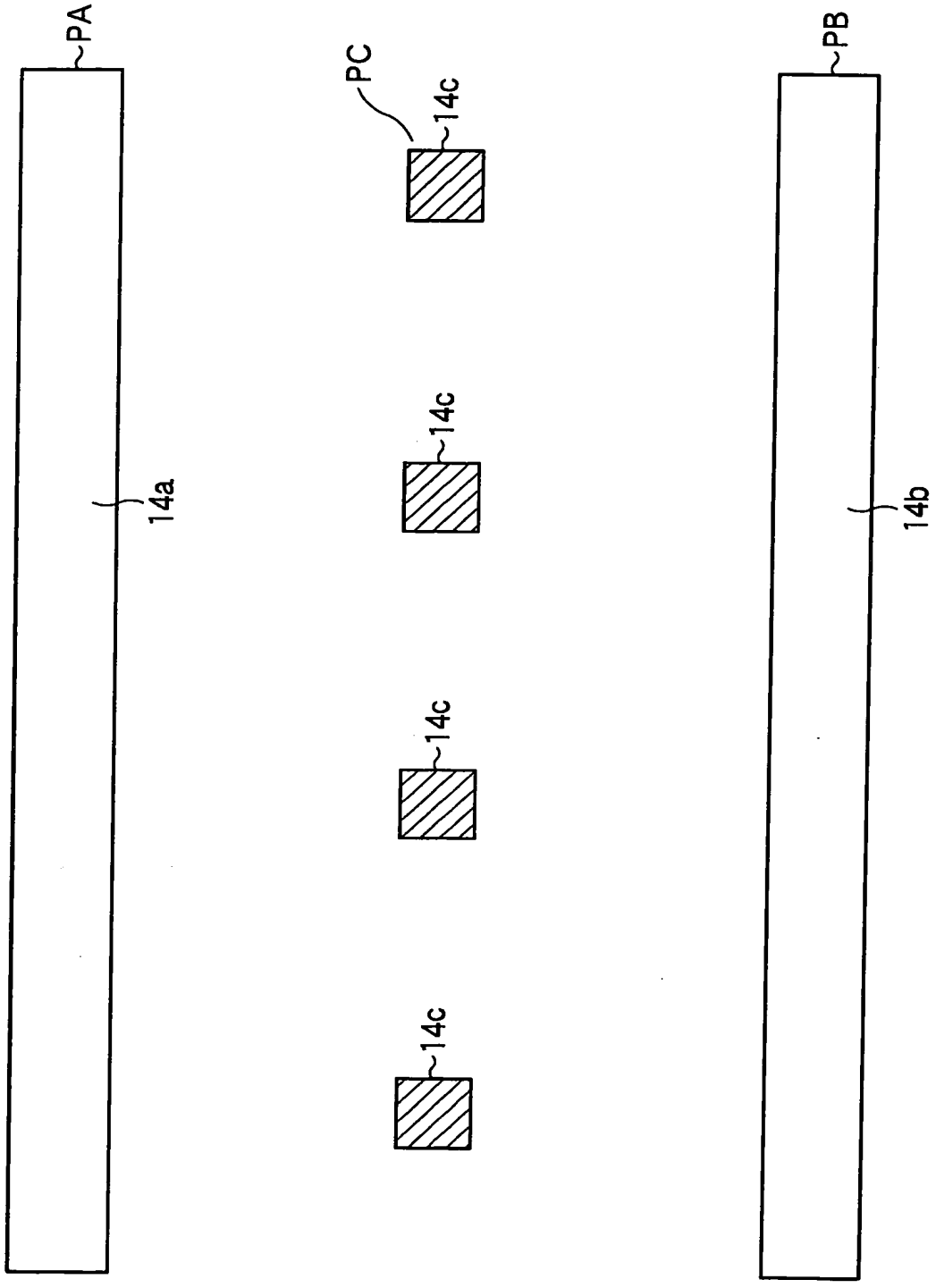
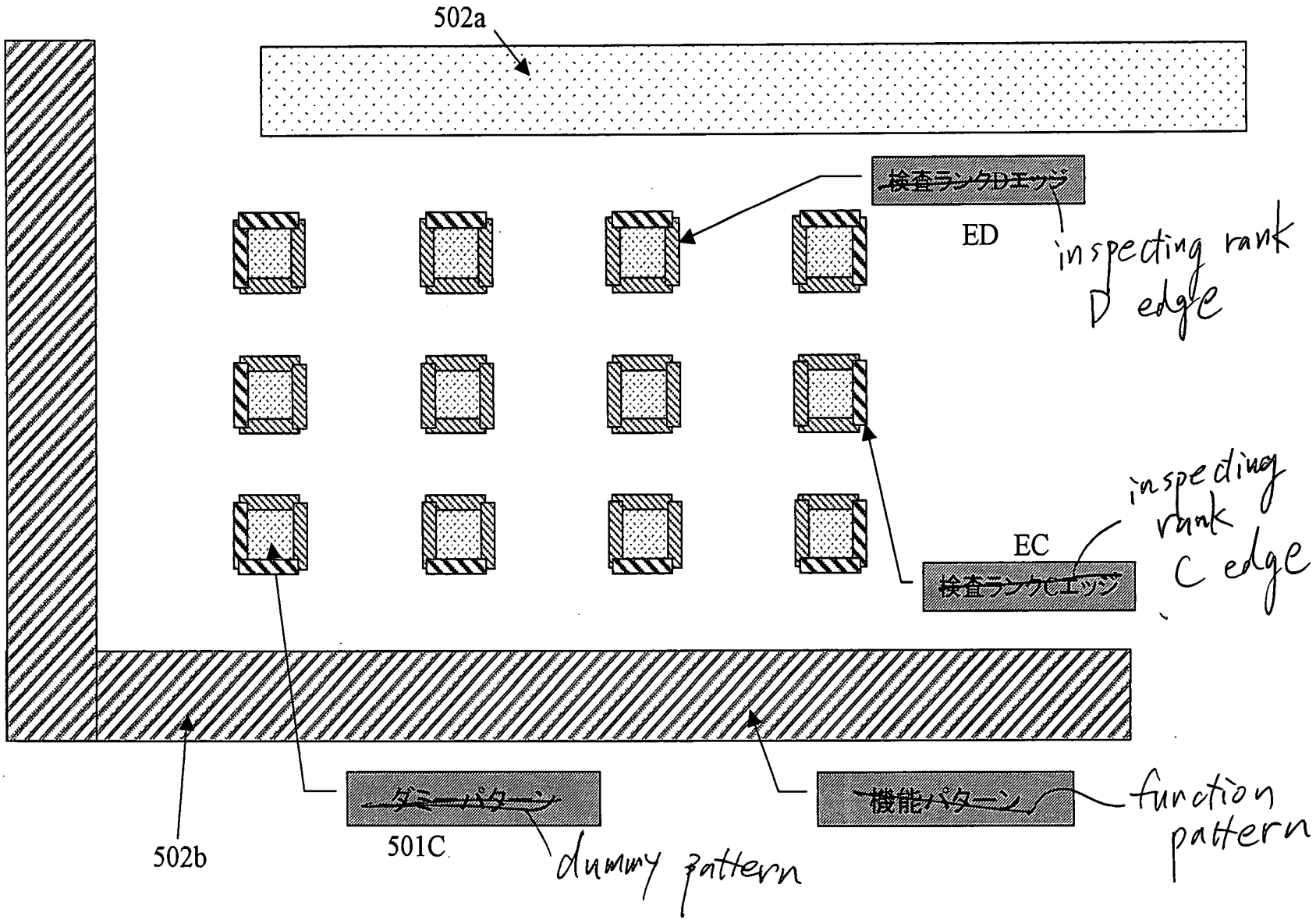


Fig. 19

~~ダミーパターンの位置関係による分類~~ Fig. 20

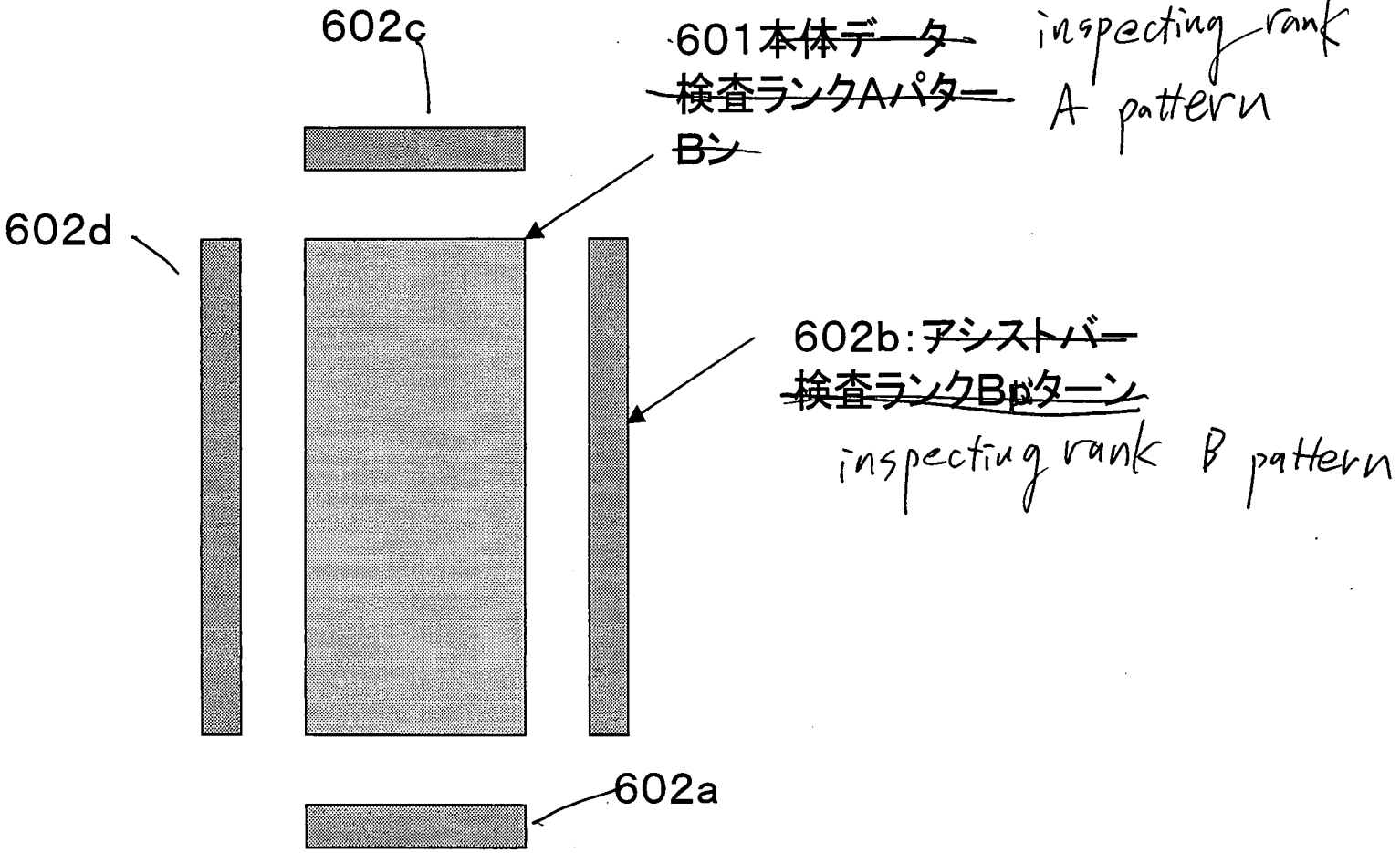
~~図20。~~



アシストバーへの適用例

図21

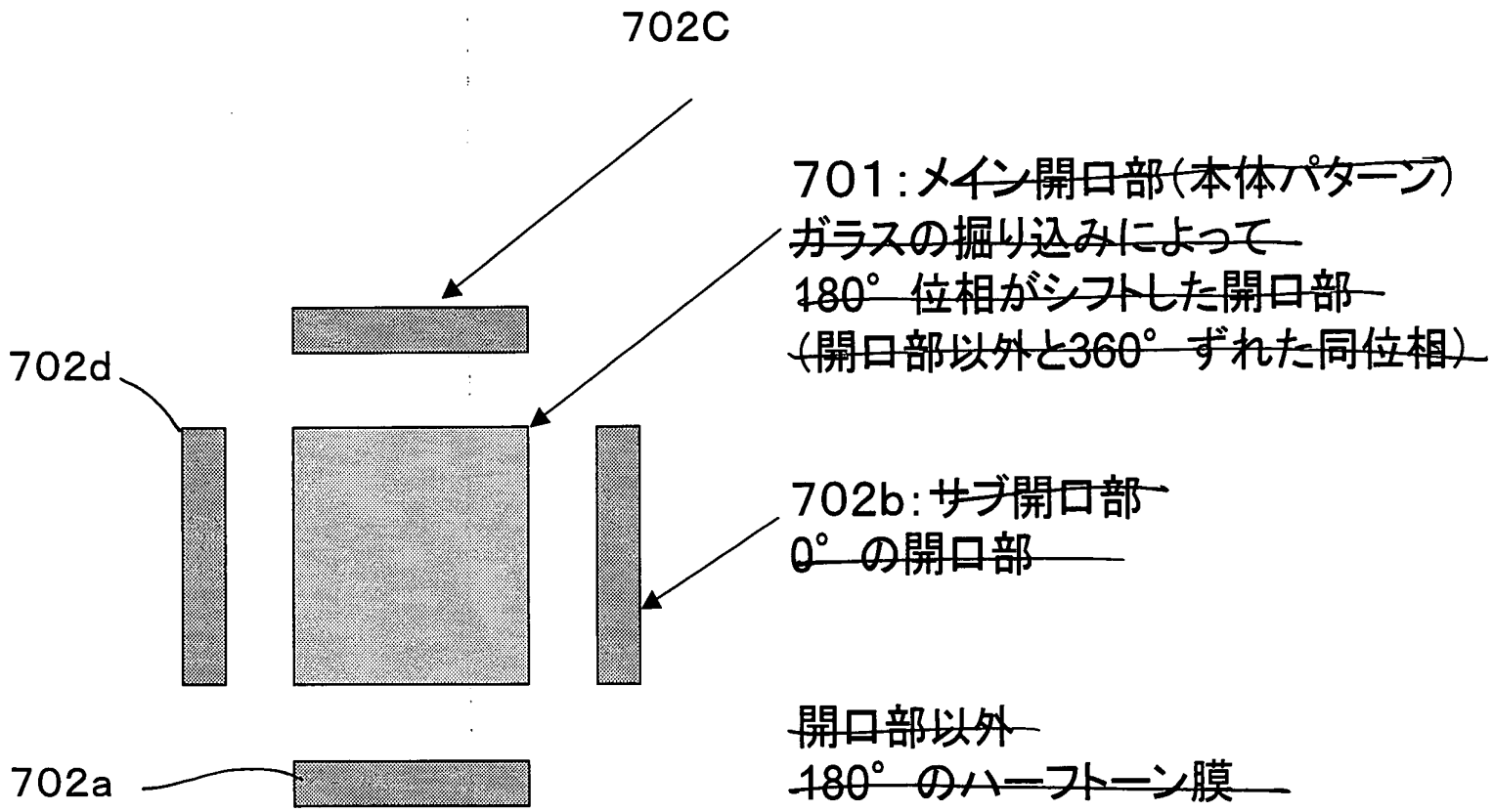
Fig. 21



位相シフトマスク(エンハンサー)への適用例

図22

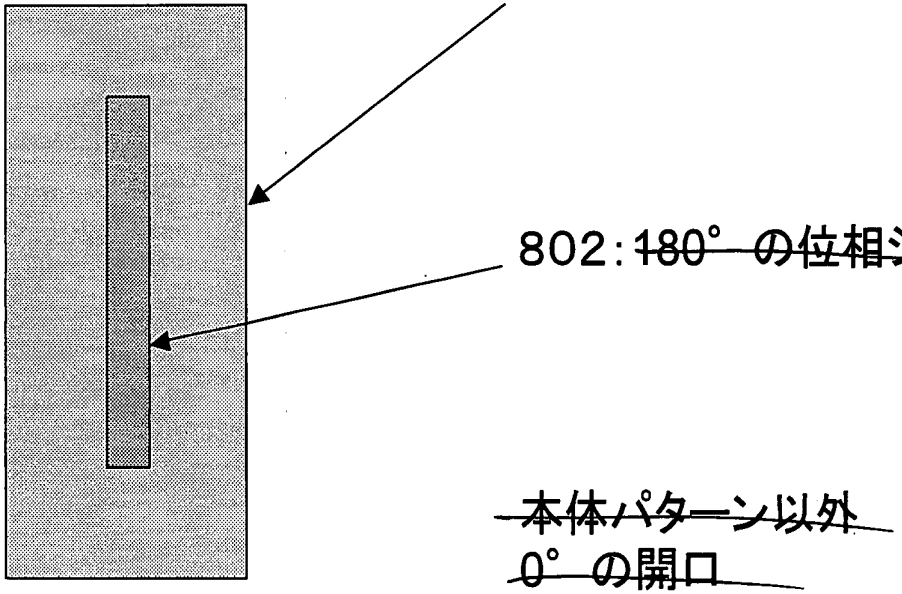
Fig. 22



位相シフトマスク(エンハンサー)への適用例

図23

Fig. 23

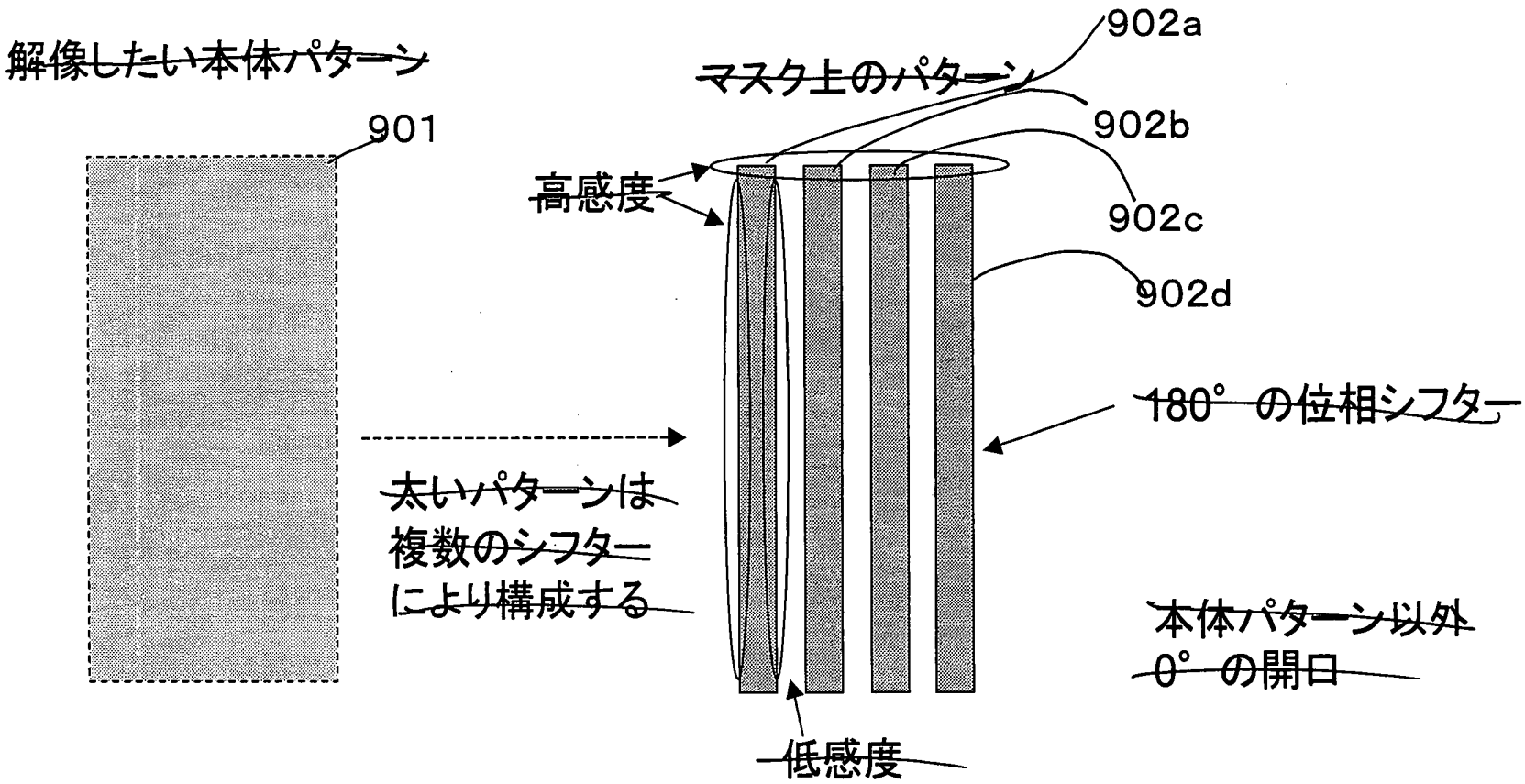


位相シフトマスク(CPL)への適用例

図24

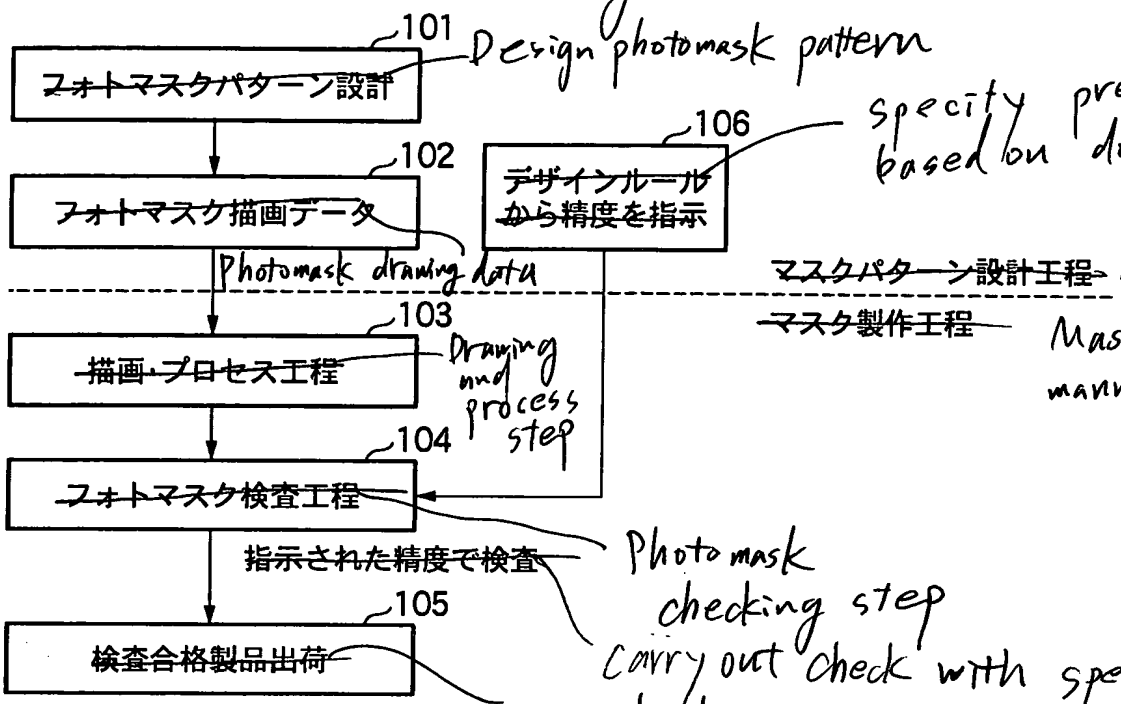
Fig. 24A

Fig. 24B

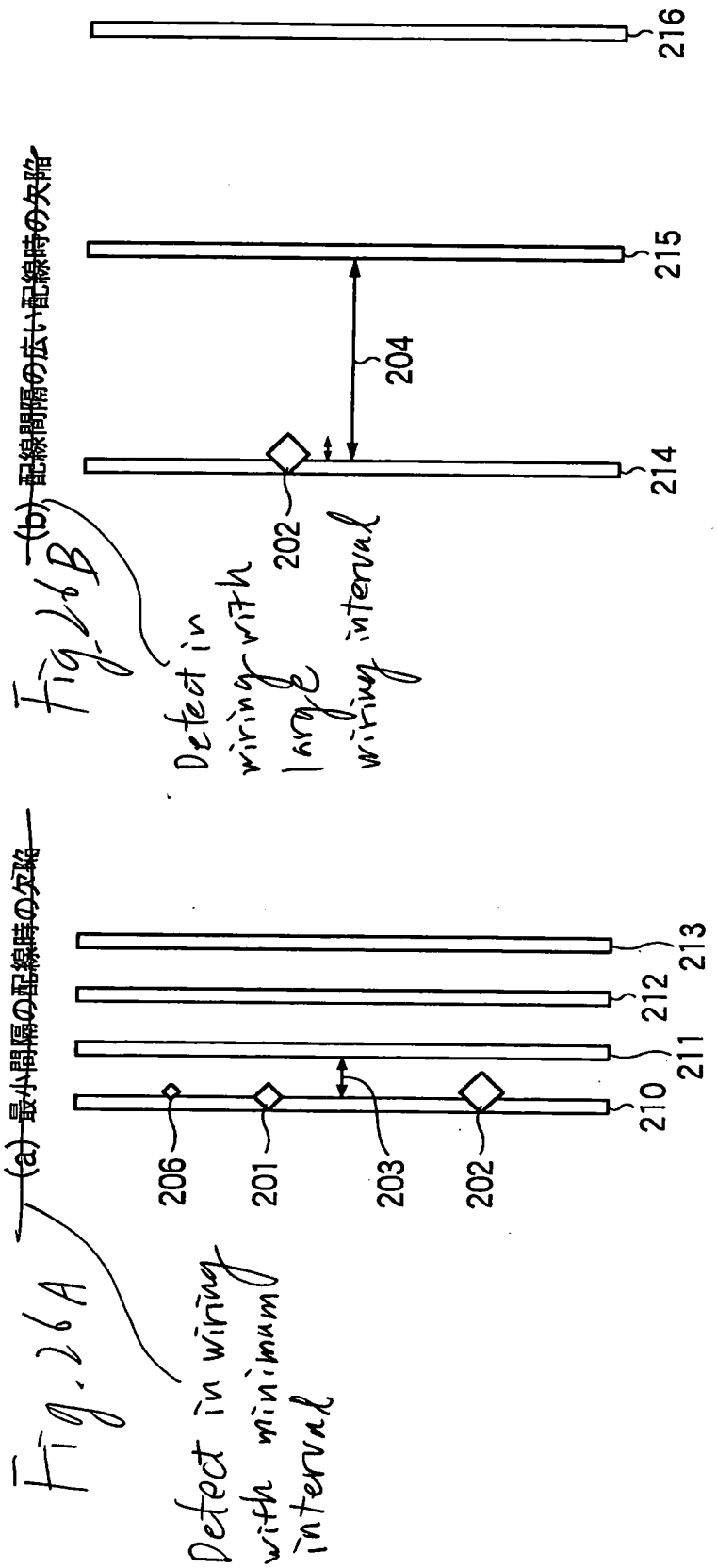


【~~図２０~~】

Fig. 25


101
フォトマスクパターン設計
Design photomask pattern
106
デザインルールから精度を指示
Specify prelision based on design rule
102
フォトマスク描画データ
Photomask drawing data
マスクパターン設計工程
Mask pattern designing step
マスク製作工程
Mask mann-facturing step
103
描画・プロセス工程
Drawing and process step
104
フォトマスク検査工程
Photo mask checking step
指示された精度で検査
Carry out check with specified precision
105
検査合格製品出荷
Ship checking accepted product

【図２１】


(a) 最小間隔の配線時の欠陥
206
201
203
202
210
211
212
213
Fig. 26A
Detect in wiring with minimum interval
(b) 配線間隔の広い配線時の欠陥
202
214
204
215
216
Fig. 26B
Detect in wiring with large wiring interval